SYNOPSIS

IMPACT OF WTO ON IRON AND STEEL INDUSTRY OF INDIA

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INTRODUCTION

Industrial development unleashes dynamic and competitive economic performance which generates income and employment, facilitates international trade and increases resource efficiency, and is thus a major driver of poverty alleviation and shared prosperity. Although industrialization contributes to the universal objective of economic growth, its impact differs depending on the country's stage of development. In developed economies, industrial growth is reflected in achieving higher productivity, embracing new technologies, intelligent production processes and reducing the effects of industrial production on the environment and climate. For developing economies like India, industrialization implies structural transformation of the economy from traditional sectors such as agriculture and fishery to modern manufacturing industries fuelled by innovation and technology. Such an expansion of the manufacturing sector creates jobs, helps improve incomes and thus reduces poverty, introduces and promotes new technologies and produces essential goods and services for the market.

International trade injects global competitiveness and hence the domestic business units tend to become very efficient being exposed international competition. Due to the integration with the world economy the entrepreneurs can have easy access to the technological innovations. International trade has also been a part of economic development for centuries. It has the potential to be a significant force for reducing global poverty by spurring economic growth, creating jobs, reducing prices, increasing the variety of goods for consumers and helping countries acquire new technologies.

The Indian economy experienced a major transformation during the decade of the 1990s. Apart from the effects of various unilateral economic reforms undertaken since 1991, the economy has had to reorient itself to the changing multilateral trade discipline within the newly written framework of the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO). World Trade Organization(WTO) facilitates implements, administration and smooth operation of trade agreements between the countries. The role of world trade organisation is to provide fair platform to its member country to help in service like exports,imports and conduct their business in a peaceful manner. Underlying the WTO's trading system is the fact that more open trade can boost economic growth and help countries develop. In addition, the WTO agreements are full of provisions that take into account the interests of developing countries. The WTO operates the global system of trade rules and

helps developing countries build their trade capacity. It also provides a forum for its members to negotiate trade agreements and to resolve the trade problems they face with each other.

The iron and Steel industry is one of the most important industries in India. India ranks second-most for the production of Iron and Steel. This industry is one of the backbones of development. Various policies are made according to the production, distribution, pricing, trade, etc. in this industry. It is one of the widely used materials all over the world. The iron and steel industry is the bottom line producer industry. This industry is the mother of all industries as it helps other secondary industries and also helps in national development. As steel and iron both have high demands due to their cost which is efficient, durable for a longer period, and easily used. Per capita consumption of these materials is high due to increasing demand. It is the basic need for the development of various other industries. Both are used for making weapons, flyovers, bridges and also used in the construction of various buildings and monuments. As it helps in making and strengthening the economy of a country then it will also help to financial growth and also provides benefits to it and its citizens.

According to Pandit Jawaharlal Nehru," Steel is a symbol of strength of the economy and portent of the glory of India for future'. Iron and steel are basic requirements for all types of construction and manufacturing activities. It is used as a basic material of manufacturing all types of machinery, electrical and metal products, transport equipment, agricultural equipment, capital goods, house building etc. So, all industries have to depend on iron and steel. It can apparently be stated that iron and steel has little or no competition because of its ideal combination of strength, rigidity and workability and the relatively high cost of alternative materials. Moreover, the steel industry has very strong forward and backward linkages in terms of material flow, income generation and employment creation. The economic prosperity and growth of an economy is very closely related to the quantity of steel consumed by it.

An understanding of comparative /competitive advantage provide clearer directives regarding the direction that an economy's trade and investment regime should adhere to in order to benefit from explicit differences in international factor endowments and relative demand. Total Factor Productivity (TFP) is a key and major factor in the success of any socio-economic system because of its direct relationship with economic welfare. In developing economies like India, efficiency is a very important factor of productivity growth especially where resources are scarce and opportunities for developing and adopting better technology have lately started dwindling. Such economies can benefit a great deal from inefficiency

studies.The performance of the supply side of an economy is often identified with the growth rate of potential output. Potential output is not observed in reality, however, and has to be approximated. The use of the production function method for the measurement of potential output growth takes into account different sources of an economy's productive capacity, namely the contributions of labour, capital and total factor productivity, the latter containing information about technological and locative efficiency and hence about the supply-side functioning. Hence the investigator was interested in undertaking the trade performance of this particular industry based on its production performance and access to the technological innovations.

Earlier Studies

Yushi Yoshida (2013), Rummana Zaheer, et al (2014) andHassan Yusefzadeh et al (2015),Doris Granabetter (2016) haveanalysed pattern of trade in industries.

Hallat et al (2012),Ahmad Assadzadeh, et al (2013), Ahmad and Dsatgir (2013), Kulwant Kaur(2014),Abtew (2015),Shahzeb etal (2021) have analysed revealed comparative and competitive advantage in industries.

Sachin N. Mehta(2015), Raju Guntukula(2018),Fannoun and Islam Hassouneh(2019)Malayaranjan Sahoo and Narayan Sethi(2020) have analysed causal relationship among important variables of trade.

Sangho Kim and MuthusamySaravanakumar (2012) Manonmani (2015),Bhatia etal (2018), Muhammad Nasir etal (2018) the have analysedifferent forms of efficiency using DEA approach in industrial sectors.

Fulwinder Pal Singh (2012),Arnab Deb and Subhash Ray (2014) have analyseddifferent components of productivity growth using DEA based Malmquist productivity index in industrial sector.

Santosh Kumar Sahu Krishnan Narayanan (2011) Muniyandi and Vadivel (2016),PesalaPeter (2017)have analysed production function in industries.

Research Gap identified

The present study differs from earlier studies in the following aspects:

First,studies measuring the impact of WTO on comparative / competitive advantagein theiron and steel industry of India are handful. Second, there are only very few studies that examined the causal linkages among the variablesnamely gross output,import and export in the

manufacturing sector of India in iron and steel industry of India due to the impact of WTO.Third,studies measuring the impact of WTO on efficiency level, productivity growth, and technological progress particularly marginal productivity of labour, marginal productivity of capital and marginal rate of technical substitution of labour for capital are handful in India.

Need for the study

Iron and steel industry is one of the basic industries of India and plays an important role in strengthening the economy. Iron and steel are among the most important components required for the infrastructure development in the country. The iron and steel industry is the bottom line producer industry. Hence the investigator was interested in undertaking the trade performance of this particular industry based on its production performance and access to the technological innovations.

Major objectives

The major objectives of the study are to:

- Analyze the impact of WTO on comparative/ competitive advantage and pattern of trade in the Iron and steel industry of India across the years.
- Examine theimpact of WTO on the causal relationship existing among export, import and gross output in the Iron and steel industry of India over the period.
- Measure theimpact of WTO on technical, scale, cost and allocative efficiency level of Iron and steel industry of India across the years.
- Analyze theimpact of WTO on productivity change and decomposing the productivity change into technical efficiency change and technological change in the Iron and steel industry of India across the years.
- Estimate theimpact of WTO onthe contribution of labour, capital and technology in the determination of gross outputin the Iron and steel industry of India across the years.

Hypotheses Framed

The null hypothesis tested in the study included the following:

- The impact of WTO has not brought about significant differences on the pattern of trade and comparative/competitive advantage in the Iron and steel industry of India across the years
- There is no significant causal relationship existing among export, import and gross output in the Iron and steel industry of India due to the impact of WTO.

- Significant differences were not observed due the impact of WTO on the technical, scale, cost and allocative efficiency level across the years.
- The impact of WTO has not brought about Significant differences in the growth of marginal productivity of labour, capital and marginal rate of technical substitution of labour for capital in the Iron and steel industry of India across the years.
- Sources of technical efficiency change and technological change in the growth of total factor productivity is not proved due to the impact of WTO in the Iron and steel industry of India over the period.

Limitations of the study

Besides theoretical consideration, the choice of the variables was guided by the availability of data.The scope of the study was restricted up to the period 2018-19, since the latest data was available up to this period. The findings and conclusions emerging out of this study may not suit other reference periods, other industries and other countries.

Scope of the Study

The outcome of the present investigation will be of immense importance to evolve develop and implement the policies relating to industrial sector particularly iron and steel industry by academicians and policy makers to decide the strategies which will lead to overall development of this particular industry in India based on the suggestions and conclusions emerging out of this study.

Methodology

This study is based on secondary data at the aggregate level. The basic data source of the study were WTO Statistical data base, Annual Survey of Industries, published by the Central Statistical Organization, Economic Survey,EPW Research Foundation covering the period from 1995 to 2019. The variables were normalised by applying Gross Domestic Product (GDP) deflator for the study. As the data was available with different base series, the data was converted into 2011-12 as base using base shifting methodology, in order to get the time series data with a single base.Based on the objectives of the study the following statistical tools such as Unit root test, Balassa Revealed Comparative Advantage(BRCA)& White's Revealed Competitive advantage(WRCA) indices,Normalized Revealed Comparative Advantage(NRCA)indices Grubel Llyod(G-L) indices, Trade Openness indices, Granger causality test, Multi-variate co-integration analysis, Vector Error Correction Model

(VECM),DEA Model, Malmquist TFP index, Cobb-Douglas production function, exponential growth function, averages, standard deviation, co-efficient of variation, Annual growth function, graphs and diagrams were also used to analyse the data. To estimate different output, computer software such as DEAP version 2.1.Eviews, SPSS.16 andMicrofitfor windows were used.

Empirical Findings

The major findings are as follows:

- The analytical results revealed that all the endogenous and exogenous variables relating to tradenamely import, export, total trade and gross output were stationary. The rejection of null hypothesis against the alternative hypothesis implied that all the time series variables were stationary at 2^{nd} difference.
- It was evident that Balassa Revealed Comparative Advantage(BRCA)indicesacross the iron and steel industry had comparative disadvantage on account of both Class 'a' (0<BRCA<1) and class 'b' (0<BRCA<2) which was indicative of the fact that there were Comparative disadvantage and weak comparative disadvantage throughout the reference period based on the theoretical range suggested by Hinloopen and Van Marrewik.
- The Grubel Lloyd(G-L) indices calculated to measure pattern of trade in iron and steel industry of India showed that it was greater than 0.7 for all the years, which explained the fact that the intra- industry trade was taking place at high level.
- Based on Normalized Revealed Comparative Advantage (NRCA) indices also it was understood that the comparative advantage from iron and steel industry was not having stronger.
- Across the reference period WRCA (White's Revealed Competitive Advantage) indices were positive and less than one. This implied that the iron and steel industry of India had less competitive strength. Throughout the reference period, an increase in the WRCA index was noted at the end of the period with wider fluctuation.
- Based on the Trace statistic and the Eigen value, there was sample evidence to reject the null hypothesis in favor of the alternative hypothesis as there is no relationship between export and import and gross output of iron and steel industry in India during the reference period under study. The relationship between gross output and export and import explained the fact there existed long run relationship among the pair of variables under study.

- The null hypotheses could not be rejected for gross output does not granger export, export does not granger cause output, import does not granger cause export, export does not granger cause import, import does not granger cause output andgross output does not granger export, Since the reported probabilities were greater than 0.05, implying that the short run relationship between were independent of each other. Uni-directional causality was noted for output does not granger cause import, since the probability value was less than 0.05.
- The results of Error correction Model (ECM) showed that the ecm(-1) for causal relationships existing between were negative which signified that there is convergence to long run equilibrium level.
- The analytical results revealed that all the endogenous and exogenous variables such asgross output,number of workers,fixed capital, andreal wagesreturn on capitalwere stationary. The rejection of null hypothesis against the alternative hypothesis implied that all the time series variables were stationary at 2^{nd} difference.
- The average technical efficiency during the period in the iron and steel industry of India was 95.4 percent in the case of VRS production technology. This meant that the industry producing its output on the production frontier would have needed just 4.6 percent of the inputs currently being used. Only a marginal amount of resource depletion to the extent of 5.7 percent more inputs meant additional energy to the extent mentioned above to produce the same output. Inefficiency calculations showed that for the industry it was 4.9 percent only.
- The scale performance of iron and steel industry over the period (1995-96 to 2018-19) showed that it had achieved the highest efficiency score (0.766) as a whole to be scale effective to the degree of 76.6%. The inefficiency score showed that it was 3.06 per cent. The average inefficiency may be partly attributed to the fact that there have been significant variations in efficiency score growth over the study period.
- As expected, more cost efficient DMUs were observed in VRS technology compared to CRS technology. Average inefficiency was more under CRS production technology than VRS production technology.
- Improvements in productivity have not been recorded in the industry over the period. This had indicated that the establishment of WTO did not bring about an improvement in productivity growth in the country's aggregate iron and steel industry sector. In other

words, technology (shift at the development frontier) need to be contributed further substantially to the further TFP growth related to technological efficiency transition.

- The positive value of the scale efficiency shift during selected period indicated that the overall iron and steel industry in India was able to take advantage of the increase in the size of the sector, while the increase in the pure technical efficiency change over the reference period suggested that there was a leaning phase, as expected by intra-firm diffusion theories, while evaluating the pattern of technical performance.
- The results explained the fact that compared to initial period MP_L and MP_K and $MRTS_{LK}$ ratios have registered an increase at the end of the reference period under study, recording significant growth rates. The growth rates recorded were 2.3 percent, 14.8 percent and 20.6 percent respectively in the above said variables were statistically significance.
- Capital co-efficient β1 was positive which implied that there existed positive and statistically significant relationship between output and capital .Labour co-efficient β2 was negative and not statistically significant which implied that there existed negative relationship between labour input and output. The sum of β1 + β2 co-efficient (s) β1 showed decreasing returns to scale, since the value was less than one.

Conclusion

By using fewer resources, at a lower opportunity cost, comparative advantage can be improved. Technical benchmarks such as speed of services, Cost efficiency, quality of products wouldbring about competitive advantage. Trade of goods within the same industry from one country to another was taking place. A trade of products that belong to different industries must be concentrated in future. In order to improve the efficiency level further under constant returns to scale production technology- technical, scale, cost and Allocative efficiency in aggregate level of India as a whole to a reasonable extent, the educational system must be reorganised to produce a profile of skilled manpower. In order to, boost the total factor productivity growth, there is a pressing need to harmonise the industrial relations between workers and management. In this context, requisite amendments in labour laws, greater participation of workers in management and rehabilitation of workers especially in case of disinvestment of public sector iron and steel industrial units are some of the spheres which require quick attention of the policy makers to create conducive environment.

References

Ahmad Assadzadeh,Davood Behbudi,Neda Faghani Miyarkolaie andHamid Mahmoudi Moghadam (2013), "A Study of the Revealed Comparative Advantage in the Textile and Clothing Industries between Iran and Turkey", Vol.5, No.2, Pp.95-107

Ali Asghar (2016), "Foreign Direct Investment and Trade Openness: The Case of South Asian Economies", Hafiz International Journal of Innovation and Applied Studies, Vol.17, No.2, Pp.513-521.

Arnab, K. Deb and Subhash C. Ray (2014), "Total Factor Productivity Growth in India Manufacturing: A Biennial Malmquist Analysis of Inter-state Data", Indian Economic Review, Vol. 49, No.1 Pp.1-25.

Ayed Noman Ahmad and Dsatgir Alam (2013), "Bangladesh's Export opportunities in the Indian Market", SouthAsia Economic Journal 12(1), Pp.117-141

Bernard O. Muse (2014), "An Auto Regressive Distributive Lag approach to Co integration: An examination of Trade Openness and Economic Growth Relationship in Nigeria", Research Journal of Economics and Business Studies, Vol.3, No.3, Pp.85-91.

Bhatia, Parul, Gupta and Priya (2018), Impact of Working Capital Efficiency on Firms' Profitability: A Study on Manufacturing Sector in India‖, Global Journal of Enterprise Information System, Vol.10, No.1, Pp.25-33

Burange, L., Sheetal, G. and Chaddha Rucha, J. (2013), "India's Revealed Comparative Advantage in Merchandise Trade", Artha Vijnana, Vol.1, No.4, Pp.332-363

Bushra Riaz (2011), "Exports an Economic Growth an Issue of Causality", www.diva-portal.se/smash/get/diva2:425665/fulltext01.pdf , Pp.6-61.

Clive Mairura and Anthoney Swamy (2015), "An Econometric Estimation of the Aggregate Import Demand Function for COMESA", International Journal of Current Research and Academic Review, Vol.3, No.11, Pp.79-106

Danmola Rasaq Akonji, Abba Mohammed Wakili and Oladipo Kolapo Sakiru (2013), "Dynamics of the Trade Balance: An Empirical investigation of Nigerian J-Curve Hypothesis", IOSR Journal of Humanities and Social Science (IOSR-JHSS), Vol.7, No.4, Pp.51-57.

Doris Granabetter (2016), “Revealed Comparative Advantage Index: An Analysis of Export Trade in the Austrian District of Burgenland”, Review of Innovation and Competitiveness, Vol.2, No.2, Pp.97-113.

Fannoun and Islam Hassouneh(2019), “The Causal Relationship between Exports, Imports and Economic Growth in Palestine Zahra’, Journal of Reviews on Global Economics, Vol.8, Pp. 258-268

Fulwinder Pal Singh (2012), “Economic Reforms and Productivity Growth in Indian Manufacturing Sector-An Interstate Analysis, International Journal of Marketing”, Financial Services and Management Research, Vol.1, No.12, Pp.1

Hallat, J. Van. Schalkwyk (2012), “Comparative advantage and competitive performance of the South African oilseed industry”, University of Free State

Hassan Yusefzadeh , Aziz Rezapour , Farhad Lotfi , Farbod Ebadifard Azar , Bahram Nabilo, Hassan Abolghasem Gorji , Mohammad Hadian , Niusha Shahidisadeghi and Atiyeh Karami (2015), “A Study of Comparative Advantage and Intra-Industry Trade in the Pharmaceutical Industry of Iran”, Vol.7, No.6, Pp.295-307.

Kakar, M.K., Kakar, R. and Khan, W. (2010), “The Determinants of Pakistan's Trade Balance: An ARDL Cointegration Approach”, Lahore Journal of Economics, Vol.15, No.1, Pp.1-26.

Kalpana Singh (2015), “Trade Openness and Volatility of India’s Exports: An Analysis”, Journal of Economics and Finance, Vol.6, No.3, Pp.18-27.

Kulwant Kaur (2014), Study of cost and productivity relationship in the small scale leather industry of selected countries, Journal of Economic Studies, 34 5, Pp. 376-388

Manni, U. H. and Ibne Afzal, M. N. (2012), “Effect of Trade Liberalization on Economic Growth of Developing Countries: A Case of Bangladesh Economy”, Journal of Business, Economics and Finance, University.

Manonmani. M (2015), Measuring Technical, scale, cost and allocative efficiency in the manufacture of blats in India using Data Envelopment Analysis‖, Journal of Indian Research, Vol.1, No.3, Pp.36-42.

Micheal benarroce and Manish Pandey (2017), “The Impact of Imports and Exports on the Size and Composition of Government Expenditure”, International Journal of Economics and Finance, Vol.9, No.3, Pp.57-68

Muhammad Nasir, Eva Arafah and Hizir Sofyan (2018) ―The efficiency of manufacturing sector: empirical evidence from aceh province Indonesia‖, Indonesian Journal of Business and Entrepreneurship, Vol.4 No.1.

Mulat Alubel Abtew (2015), "Revealed Comparative Advantage of Ethiopian Leather Industry with Selected African Economies",International Journal of Business and Economics Research, Vol.4, No.5, Pp.229-237.

Muniyandi, C. and Vadivel, l. (2016), "An Economic Analysis of Return to Scale of Manufacturing Industries in Tamil Nadu", Indian Journal of Economics and Development, Vol. 4, No. 3, Pp. 1-3.

Musibau Adetunji Babatunde (2014), "Are Exports and Imports Cointegrated? Evidence from Nigeria", Journal of International and Global Economic Studies, Vol.7, No.2, Pp.45-67.

Malayaranjan Sahoo and Narayan Sethi(2020), The Dynamic Relationship between Export, Import and Inflation: Empirical Evidence from India, The Indian Economic Journal, in.sagepub.com/journals-permissions-india, Pp. 1–18

Okwo, Ifeoma Mary, Agu, Charles kechukwu, Ugwunta and David Okelue (2012), "The Causal Link between Foreign Direct Investment, Export and Economic Growth in Nigeria: An Application of Granger Causality", International Journal of Current Research, Vol.4, No.11, Pp.262-266.

Pesala Peter (2017), Indian manufacturing industry in the era of globalization: A CobbDouglas production function analysis‖, Indian Journal of Economics and Development, Vol. 5, No.1.

Raju Guntukula(2018), "Exports, imports and economic growth in India: Evidence from cointegration and causality analysis'', Theoretical and Applied Economics, Vol.xxv, No. 2(615), summer, pp. 221-230

Rummana Zaheer, Muhammad Fowad Khan Niazi and Umair Nizami (2014), "Intra Industry Trade of Pakistan", Journal of Economics and Sustainable Development, Vol.5, No.25, Pp.121-127

Saeed Rasekhi and Saman Ghaderi (2012), "Marginal Intra-Industry Trade and Adjustment Costs: The Case Study of Iran's Manufacturing Industries", International Journal of Economics and Business Research, Vol.4, No.1/2, Pp.35-43.

Sachin N. Mehta,(2015) "The Dynamics of Relationship between Exports, Import and Economic Growth in India International Journal of Research in Humanities & Social Science, Vol. 3, No.7

Sandeep Kumar Baliyan, Kavita Baliyan and Pratima Ghosh (2015), "Technical Efficiency and Productivity Change in the Indian Manufacturing Industries: A State Wise Analysis", Journal of Regional Development and Planning, Vol.4, NO.2, Pp.45-59.

Sangho Kim and Muthusamy Saravanakumar (2012), "Economic Reform and Total Factor Productivity Growth in Indian Manufacturing Industries", Social Science Research Network, Vol.16, No.1, Pp.152-166

Santosh Kumar Sahu Krishnan Narayanan (2011), Total factor productivity and energy intensity in Indian manufacturing: a cross-sectional study‖, International Journal of Energy Economics and Policy, Vol.1, No.2, Pp.47-58.

Syed Mohd Shahzeb et al (2021). India's Export Potential and Competitiveness with UAE: An Exploratory Study, Saudi Journal of Economics and Finance, 5(1), Pp.16-27.

Yushi Yoshida (2013), "Intra-industry Trade, Fragmentation and Export Margins: An Empirical Examination of Sub-Regional International Trade", North American Journal of Economics and Finance, Vol.2, No.4, Pp.125-138.

Zahra Sheidaei and Seyed Peyman Asadi (2016), "Causal Relationship between Trade Efficiency and Economic Efficiency: Evidence from Dynamic Simultaneous Equations Models", The Journal of International Trade & Economic Development, Vol.26, No.4, Pp.473-487.